CLAIMS

What Is Claimed is:

1. A cooking thermometer having an audible alarm, comprising:

a generally cylindrical housing assembly and a substantially hollow skewer extending coaxially therefrom, said skewer having a proximal end contiguous to said housing assembly and a sharpened distal end; said housing assembly further including a temperature indicia plate, a pivoting pointer movable over said indicia plate; a set temperature needle selectably manually positionable over said indicia plate, and a tension wound spring-type audible alarm mechanism activated by alignment of said set temperature needle and said pointer,

a linear segment of heat contractible shape memory alloy wire disposed within said skewer and having a first end and a second end wherein said first end is fastened to said distal end of said skewer, said shape memory alloy wire being selected such that said wire begins phase transformation at a first lower temperature M_S and completes phase transformation at a second higher temperature A_F;

a connecting rod disposed within said skewer and secured to said second end of said shape memory alloy wire; said connecting rod having an upper end extending into said cylindrical housing assembly;

a cam assembly operatively associated with said connecting rod wherein vertical movement of said connecting rod is translated into rotational motion and transmitted to said pointer through a gear assembly; and

a spring biasing means constructed and arranged to exert stress on said shape memory alloy wire during phase transformation, said spring biasing means having parameters which are configured to impart desired phase transformation characteristics to said shape memory alloy;

whereby optimization of said austenite/martensite phase transition and linearity of temperature response are obtained.

2. The cooking thermometer of claim 1, wherein M_S is approximately 140° F and A_F is approximately 185° F.

3. The cooking thermometer of claim 1, wherein said shape memory alloy is nickel titanium.

4. The cooking thermometer of claim 1, wherein said spring biasing means is at least one helical spring coaxially positioned on the upper end of said connecting rod, said at least one helical spring housed between upper and lower retaining members wherein said upper retaining member is contiguous to said connecting rod

whereby contraction of said shape memory alloy compresses said spring.

5. The cooking thermometer of claim 1, wherein said at least one helical spring has a spring constant of about 7.0 lb/in., a free length of about 0.38 in., a solid length of about .096 in., and a load at solid length of about 1.7 lbs..

6. The cooking thermometer of claim 5, further including a second helical spring which does not come under load until said shape memory alloy has contracted about 50% of its travel distance, said second spring having a spring constant of about 7.3 lb./in., a free length of about 0.335 in., a solid length of about 0.104 in. and a load at solid length of about 2.3 lbs..

7. The cooking thermometer of claim 1, wherein said housing assembly includes upper and lower portions rotatable with respect to one another, wherein rotation of said upper portion with respect to said lower portion winds said alarm mechanism.

8. The cooking thermometer of claim 7, wherein said housing assembly further includes a rotatable central ring portion circumferentially disposed between said upper and lower portions, said central ring portion linked with said set needle to

allow manual selection of a set temperature by rotation of the ring portion.

9. The device of claim 1, wherein said housing assembly further comprises a circumferential lip extending outwardly therefrom and a plurality of radially arranged piercing implements depending from said circumferential lip parallel to said skewer;

a mesh curtain formed as a tube circumferentially attached to said lip and extending downwardly therefrom; and

a plurality of ring members extending through said mesh curtain proximate said piercing implements, said ring members slidably positionable on said piercing elements.

10. The device of claim 9, wherein said mesh curtain is comprised of stainless steel mesh.

11. The device of claim 1, wherein the distal end of said skewer includes a plurality of barbs extending therefrom adapted to retain said skewer within a food item.

12. A cooking thermometer, comprising:

a generally cylindrical housing assembly and a substantially hollow skewer

extending coaxially therefrom, said skewer having a proximal end contiguous to said housing assembly and a sharpened distal end; said housing assembly further including a temperature indicia plate and a pivoting pointer movable over said indicia plate;

a linear segment of heat contractible shape memory alloy wire disposed within said skewer and having a first end and a second end wherein said first end is fastened to said distal end of said skewer, said shape memory alloy wire being selected such that said wire begins an austenite/martensite phase transformation at a first lower temperature MS and completes phase transformation at a second higher temperature AF;

a connecting rod disposed in said skewer and secured to said second end of said shape memory alloy wire; said connecting rod having an upper end extending into said cylindrical housing assembly;

a cam assembly operatively associated with said connecting rod wherein vertical movement of said connecting rod is translated into rotational motion and transmitted to said pointer through a gear assembly; and

a spring biasing means constructed and arranged to exert stress on said shape memory alloy wire during phase transformation, said spring biasing means having parameters which are configured to impart desired phase transformation characteristics to said shape memory alloy;

whereby optimization of said austenite/martensite phase transition and linearity of temperature response are obtained.

13. The cooking thermometer of claim 12, wherein MS is approximately 140° F and AF is approximately 185° F.

14. The cooking thermometer of claim 12, wherein said shape memory alloy is nickel titanium.

15. The cooking thermometer of claim 12, wherein said spring biasing means is at least one helical spring coaxially positioned on the upper end of said connecting rod, said at least one helical spring housed between upper and lower retaining members wherein said upper retaining member is contiguous to said connecting rod whereby contraction of said shape memory alloy compresses said spring.

16. The cooking thermometer of claim 15, wherein said helical spring has a spring constant of about 7.0 lb/in., a free length of about 0.38 in., a solid length of about .096 in., and a load at solid length of about 1.7 lbs..

17. The cooking thermometer of claim 16, further including a second helical

spring which does not come under load until said shape memory alloy has contracted about 50% of its travel distance, said second spring having a spring constant of about 7.3 lb./in., a free length of about 0.335 in., a solid length of about 0.104 in. and a load at solid length of about 2.3 lbs..

18. The cooking thermometer of claim 12, further comprising a set temperature needle selectably manually positionable over said indicia plate.

19. The cooking thermometer of claim 18, wherein said housing assembly further includes a rotatable central ring portion circumferentially disposed between said upper and lower portions, said central ring portion linked with said set needle to allow manual selection of a set temperature by rotation of the ring portion.